

## SIGNIFICANT PERMIT REVISION DESCRIPTION

This significant revision authorizes Phelps Dodge Bagdad, Inc. to add new equipment that will operate in conjunction with existing equipment to refine molybdenum concentrate ( $\text{MoS}_2$ ) into molybdenum trioxide ( $\text{MoO}_3$ ), which will also produce a rhenium solution by-product. New equipment will include a steam deoiler to remove organics from the molybdenum concentrate, a filtration system for processing the molybdenum trioxide, and a solution extraction system for concentrating rhenium by-product. Conversion of the molybdenum concentrate into molybdenum trioxide will be conducted with the existing leaching system, which is also used for leaching the copper concentrate. The system will be designed to process an average molybdenum concentrate of 4 tons per hour.

### ATTACHMENT "B": SPECIAL CONDITIONS

#### **Addenda (Significant Revision #45670)** **to Operating Permit #0363-89** **for** **Phelps Dodge Bagdad, Inc.**

*The following are hereby added to Permit # 0363-89.*

- I.** In addition to this significant permit revision, the Permittee shall comply with the requirements of Operating Permit # 0363-89, Significant Revision # 0363S1-89, 1000946, 1001720, Installation Permit # 1227, 1237, 78002, M251082, 251202, and Minor Revision # 1000407, 1000359, 1000391, 1000571, 1000217, 1000743, 1001061, 1001244, 27751, 32233, 33192, 34383, 35019, 34655, 37879, 41830, 44283.

**II. NATURAL GAS STEAM GENERATOR PACKAGE AND NATURAL GAS DEOILER HEATER**

This Section applies to the Natural Gas Steam Generator Package (M-SG) and Natural Gas Deoiler Heater (M-DH).

**A. Fuel Limitations**

The Permittee shall burn only natural gas as fuel in the steam generator and heater.

[A.A.C. R18-2-306.A.2]

**B. Particulate Matter (PM) Requirements**

**1. Emission Limitations/Standards**

- (a) The Permittee shall not cause, allow or permit the emission of particulate matter, caused by combustion of fuel, from any fuel-burning operation into the atmosphere in excess of the amounts calculated by the following equation:

$$E = 1.02 Q^{0.769}$$

where:

E = the maximum allowable particulate emission rate in pounds-mass per hour.

Q = the heat input in million Btu per hour.

[A.A.C. R18-2-724.C.1]

- (b) For purposes of this Section, the heat input shall be the aggregate heat content of all fuels whose products of combustion pass through a stack or other outlet. The total heat input of all fuel-burning units on a plant or premises shall be used for determining the maximum allowable amount of particulate matter, which may be emitted. [A.A.C. R18-2-724.B]

2. Monitoring, Recordkeeping, and Reporting Requirements

The Permittee shall maintain a vendor-approved copy of that part of the Federal Energy Regulatory Commission (FERC) approved Tariff agreement that contains the sulfur content and the lower heating value of the pipeline quality natural gas to demonstrate compliance with the PM limit specified in Condition II.B.1.(a). These records shall be made available to ADEQ upon request.

[A.A.C. R18-2-306.A.3]

3. Permit Shield

[A.A.C. R18-2-325]

Compliance with the conditions of this Part shall be deemed compliance with A.A.C. R18-2-724.B and A.A.C R18-2-724.C.1.

**C. Opacity Standard Requirements**

1. Emission Limitations/Standards

The Permittee shall not cause, allow or permit the opacity of any plume or effluent from either the steam generator or the Deoiler heater to exceed 15%.

[A.A.C. R18-2-724.J]

2. Monitoring, Recordkeeping and reporting Requirements

- (a) A certified EPA Reference Method 9 observer shall conduct a monthly survey of visible emissions emanating from the stacks of the steam generator and heater. If the opacity of the emissions observed appears to exceed the standard, then the observer shall conduct a certified EPA Reference Method 9 observation. The Permittee shall keep records of the initial survey and any EPA Reference Method 9 observations performed. These records shall include the emission point observed, location of observer, name of observer, date and time of observation, and the results of the observation. [A.A.C. R18-2-306.A.3.c]

- (b) If the Method 9 opacity reading is in excess of 15%, then the Permittee shall initiate appropriate corrective action to reduce the opacity below 15%. The Permittee shall keep a record of the corrective action performed. [A.A.C. R18-2-306.A.3.c]

- (c) The Permittee shall report all 6-minute periods during which the visible emissions exceed 15 percent opacity, as required under Section XII of Attachment "A". [A.A.C. R18-2-724.J]

3. Permit Shield

[A.A.C. R18-2-325]

Compliance with the conditions of this Part shall be deemed compliance with A.A.C R18-2-724.J.

### III. SETTLING TANK & SOLUTION EXTRACTION PROCESS

This Section applies to the Settling Tank (M-ST) & Solution Extraction (SX) Process (including equipment such as Mixer Extraction Settlers (M-MXS1&2), Mixer Washer Settler (M-MWS), CCD Thickeners, and Mixer Stripper Settler (M-MSS)).

#### A. Emission Limitations/Standards

1. The Permittee shall not cause or permit the emission of gaseous or odorous materials from equipment and operations in such quantities or concentrations as to cause air pollution. [A.A.C. R18-2-730.D]
2. Materials including solvents or other volatile compounds, acids and alkalis shall be processed, stored, used and transported in such a manner and by such means that they will not evaporate, leak, escape or be otherwise discharged into the ambient air so as to cause or contribute to air pollution. Where means are available to reduce effectively the contribution to air pollution from evaporation, leakage or discharge, the installation and use of such control methods, devices or other equipment shall be mandatory. [A.A.C. R18-2-730.F]
3. Where a stack, vent or other outlet is at such a level that fumes, gas mist, odor, smoke, vapor or any combination thereof constituting air pollution is discharged to adjoining property, the Director may require the installation of abatement equipment or the alteration of such stack, vent or other outlet by the Permittee to a degree that will adequately dilute, reduce or eliminate the discharge of air pollution to adjoining property. [A.A.C. R18-2-730.G]

#### B. Air Pollution Control Requirement

*The Permittee shall maintain and use covers on the mixer settler tanks to control emissions from the Solution Extraction Plant.*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underline and italics]

#### C. Monitoring, Reporting and Recordkeeping Requirements

The Permittee shall maintain a record of all control measures used to limit emissions from the SX process.

[A.A.C. R18-2-306.A.3.c]

#### D. Permit Shield

[A.A.C. R18-2-325]

Compliance with the conditions of this Part shall be deemed compliance with A.A.C. R18-2-730.D, A.A.C. R18-2-730.F, and A.A.C. R18-2-730.G.

#### IV. CONCENTRATE FEED HOPPER, SCREW CONVEYORS 1 & 2, FILTER 2, AND MOLYBDENUM (MoO<sub>3</sub>) HOPPER

This Section applies to the Concentrate Feed Hopper, Screw Conveyors 1 & 2, Filter 2, and Molybdenum (MoO<sub>3</sub>) Hopper.

##### A. Particulate Matter (PM) Requirements

###### 1. Emission Limitations/Standards [A.A.C. R18-2-721.B.1]

- (a) The Permittee shall not cause, allow, or permit the discharge of particulate matter into the atmosphere in any one hour in total quantities in excess of the amount calculated by the following equation:

$$E = 4.10P^{0.67}$$

where:

E = the maximum allowable particulate emissions rate in pounds-mass per hour.

P = the process weight rate in tons-mass per hour.

- (b) The total process weight from all similar units employing a similar type process shall be used in determining the maximum allowable emission of particulate matter. [A.A.C. R18-2-721.D]

###### 2. Monitoring, Recordkeeping, and Reporting Requirements

The Permittee shall maintain records of the daily process rate and hours of operation of all material handling facilities. [A.A.C. R18-2-721.F]

###### 3. Permit Shield [A.A.C. R18-2-325]

Compliance with the conditions of this Part shall be deemed compliance with A.A.C. R18-2-721.B.1, and A.A.C. R18-2-721.D, and A.A.C. R18-2-721.F.

##### B. Opacity Standard Requirements

###### 1. Emission Limitations/Standards

- (a) The Permittee shall not cause, allow or permit visible emissions in excess of 20 percent opacity for point sources, and 40% for non-point sources, as measured by EPA Reference Method 9.

[A.A.C. R18-2-702.B]

- (b) If the presence of uncombined water is the only reason for an exceedance of any visible emissions requirement, then the exceedance shall not constitute a violation of the applicable opacity limit.

[A.A.C. R18-2-702.C]

2. Monitoring, Recordkeeping, and Reporting Requirements

A certified EPA Reference Method 9 observer shall conduct a monthly survey of visible emissions emanating from the Concentrate Receiving Hopper, Screw Conveyors 1 & 2, and Molybdenum (MoO<sub>3</sub>) Hopper. If the opacity of the emissions observed appears to exceed the opacity limit contained in **Condition IV.B.1.(a)** of this Attachment, then the observer shall conduct a certified EPA Reference Method 9 observation. The Permittee shall keep records of the initial survey and any EPA Reference Method 9 observations performed. These records shall include the emission point observed, location of observer, name of observer, date and time of observation, and the results of the observation. If the observation results in an exceedance of the opacity limit contained in **Condition IV.B.1.(a)** of this Attachment, then the Permittee shall take corrective action and log all such actions. Such exceedance shall be reported as excess emissions in accordance with Section XII.A of Attachment "A".

[A.A.C. R18-2-306.A.3.c]

3. Permit Shield

[A.A.C. R18-2-325]

Compliance with the conditions of this Part shall be deemed compliance with A.A.C. R18-2-702.B and A.A.C. R18-2-702.C.

**V. CONCENTRATE BELT FEEDER, STEAM DEOILER, BELT FILTER, AND MOLYBDENUM (MoO<sub>3</sub>) STORAGE BIN**

This Section applies to the Concentrate Belt Feeder, Steam Deoiler, Belt Filter, and Molybdenum (MoO<sub>3</sub>) Storage Bin.

**A. Particulate Matter (PM) Requirements**

1. Emission Limitations/Standards

The Permittee shall not cause to be discharged into the atmosphere from an affected facility any stack emissions that contain particulate matter in excess of 0.05 grams per dry standard cubic meter.

[40 CFR 60.382.a.1]

2. Air Pollution Control Equipment

(a) *The Permittee shall install, maintain, and operate the Wet Venturi Scrubber (M-VS) and the Wet Packed Scrubber (M-PS) to control particulate matter emissions from the Steam Deoiler.*

[A.A.C. R18-2-306.A.2 and A.A.C. R18-2-331]

[Material permit conditions are indicated by underline and italics]

(b) *At all times, including periods of startup, shutdown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate the Wet Venturi Scrubber (M-VS) and the Wet Packed Scrubber (M-PS) in a manner consistent with good air pollution control practice for minimizing particulate matter emissions.*

[40 CFR §60.11(d) and A.A.C. R18-2-331]

[Material permit conditions are indicated by underline and italics]

### 3. Monitoring, Recordkeeping, and Reporting Requirements

- (a) The Permittee shall install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream through the Wet Venturi and Wet Packed Scrubbers. The monitoring device must be certified by the manufacturer to be accurate within  $\pm 250$  pascals ( $\pm 1$  inch water) gauge pressure and must be calibrated on an annual basis in accordance with manufacturer's instructions. [40 CFR 60.384.a and A.A.C. R18-2-331.A.3.e]

[Material Permit Conditions are indicated by underline and italics]

- (b) The Permittee shall install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the scrubbing liquid flow rate to each operating scrubber. The monitoring device must be certified by the manufacturer to be accurate within  $\pm 5$  percent of design scrubbing liquid flow rate and must be calibrated on at least an annual basis in accordance with manufacturer's instructions. [40 CFR 60.384.b and A.A.C. R18-2-331.A.3.e]

[Material Permit Conditions are indicated by underline and italics]

- (c) The Permittee shall record on a weekly basis the measurements of both the change in pressure of the gas stream across each operating scrubber and the scrubbing liquid flow rate. [40 CFR 60.385.b & A.A.C. R18-2-306.A.3.c]

- (d) The Permittee shall submit semi-annual reports of occurrences when the measurements of the scrubber pressure loss (or gain) or liquid flow rate differ by more than  $\pm 30$  percent from the average obtained during the most recent performance test. These reports shall be postmarked within 30 days following the end of the second and fourth calendar quarters.

[40 CFR 60.385.b, -385.c & A.A.C. R18-2-306.A.3.c]

### 4. Testing Requirements

- (a) The Permittee shall conduct EPA Reference Method 5 or 17 tests within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of such facility, and upon request by the Director to determine compliance with **Condition V.A.1** of this Attachment. The sample volume for each run shall be at least 1.70 dscm (60 dscf). The sampling probe and filter holder of Method 5 may be operated without heaters if the gas stream being sampled is at ambient temperature. For gas streams above ambient temperature, the Method 5 sampling train shall be operated with a probe and filter temperature slightly above the effluent temperature (up to a maximum filter temperature of 121°C (250°F)) in order to prevent water condensation on the filter.

[40 CFR 60.386.b.1]

- (b) The Permittee shall submit to the Director a written report of the results of the performance test. [40 CFR 60.385.a]

### 5. Permit Shield

[A.A.C. R18-2-325]

Compliance with the conditions of this Part shall be deemed compliance with 40 CFR 60.382.a.1, CFR 60.384.a, 40 CFR 60.384.b, 40 CFR 60.385.a, 40 CFR 60.385.b, 40 CFR 60.385.c, and 40 CFR 60.386.b.1.

## B. Opacity Standard Requirements

### 1. Emission Limitations/Standards

- (a) *The Permittee shall not cause to be discharged into the atmosphere any stack emissions that exhibit greater than 7 percent opacity, as measured by EPA Reference Method 9, unless the stack emissions are discharged from a wet scrubbing emission control device.*

[40 CFR 60.382.a.2 and A.A.C. R18-2-331.A.3.f]

[Material Permit Conditions are indicated by underline and italics]

- (b) *The Permittee shall not cause to be discharged into the atmosphere from an affected facility any process fugitive emissions that exhibit greater than 10 percent opacity.*

[40 CFR 60.382.b and A.A.C. R18-2-331.A.3.f]

[Material Permit Conditions are indicated by underline and italics]

### 2. Monitoring, Recordkeeping, and Reporting Requirements

- (a) A certified EPA Reference Method 9 observer shall conduct a monthly survey of visible emissions emanating from the concentrate belt feeder, steam deoiler, Molybdenum (MoO<sub>3</sub>) Storage Bin, belt filter and the flare. If the opacity of the emissions observed appears to exceed the opacity limits contained in **Conditions V.B.1.(a)** and (b) of this Attachment, then the observer shall conduct a certified EPA Reference Method 9 observation. The Permittee shall keep records of the initial survey and any EPA Reference Method 9 observations performed. These records shall include the emission point observed, location of observer, name of observer, date and time of observation, and the results of the observation. If the observation results in an exceedance of the opacity limits contained in **Conditions V.B.1.(a)** and (b) of this Attachment, then the Permittee shall take corrective action and log all such actions. Such exceedance shall be reported as excess emissions in accordance with Section XII of Attachment "A".

[A.A.C. R18-2-306.A.3.c]

- (b) The Permittee shall use EPA Reference Method 9 to determine compliance with **Condition V.B.1.(a)**. The observer shall read opacity only when emissions are clearly identified as emanating solely from the affected facility being observed.

[40 CFR 60.386.b.2 and

A.A.C. R18-2-306.A.3.c]

### 3. Permit Shield

[A.A.C. R18-2-325]

Compliance with the conditions of this Part shall be deemed compliance with 40 CFR 60.382.a.2, 40 CFR 60.382.b, and 40 CFR 60.386.b.2.

## C. Volatile Organic Compound (VOC) Requirements

### 1. Operating Limitations

- (a) The Permittee shall operate and maintain the flare in conformance with the manufacturer designs. [A.A.C. R18-2-306.A.2 and A.A.C. R18-2-331]  
[Material permit conditions are indicated by underline and italics]
- (b) The flare chamber temperature shall be equal to or greater than 1300°F.  
[A.A.C. R18-2-306.A.2]

### 2. Emission Limitations/Standards

The Permittee shall not cause to be discharged into the atmosphere from the operation of a flare any emissions that contain volatile organic compounds in excess of 1.36 pounds per hour.  
[A.A.C. R18-2-306.01 and A.A.C. R18-2-331]  
[Material permit conditions are indicated by underline and italics]

### 3. Air Pollution Control Requirement [A.A.C. R18-2-306.A.2 and -331.A.3.c]

- (a) The Permittee shall install, maintain, and operate the Wet Venturi Scrubber (M-VS) to control VOC emissions from the Steam Deoiler.  
[A.A.C. R18-2-306.A.2 and A.A.C. R18-2-331]  
[Material permit conditions are indicated by underline and italics]
- (b) At all times, including periods of startup, shutdown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate the Wet Venturi Scrubber (M-VS) in a manner consistent with good air pollution control practice for minimizing VOC emissions.  
[A.A.C. R18-2-306.01 and A.A.C. R18-2-331]  
[Material permit conditions are indicated by underline and italics]
- (c) At all times, including periods of start-up, shutdown and malfunction, the Permittee shall install, maintain, and operate a flare (M-F) to control VOC emissions from the Steam Deoiler which are not captured by either the Wet Venturi Scrubber or the Wet Packed Scrubber (M-PS) in a manner consistent with good air pollution control practices.  
[A.A.C. R18-2-306.01 and A.A.C. R18-2-331]  
[Material permit conditions are indicated by underline and italics]

### 4. Monitoring, Recordkeeping, and Reporting Requirements [A.A.C. R18-2-306.A.3]

- (a) The Permittee shall install, calibrate, maintain and operate a thermocouple or any other equivalent device for the continuous measurement of temperature in the flare chamber. The monitoring device shall be certified by the manufacturer to be accurate within  $\pm 100$  °F and must be calibrated on an annual basis in accordance with manufacturer's instructions.  
[A.A.C. R18-2-306.A.3 and A.A.C. R18-2-331]  
[Material Permit Conditions are indicated by underline and italics]
- (b) Except for periods of maintenance, repair, calibrations and when the deoiler is



not operating, the Permittee shall continuously monitor and record the flare chamber temperature.

5. Testing Requirements

- (a) Within 180 days of issuance of the permit, the Permittee shall perform an initial performance test for VOC emissions to demonstrate compliance with the emission limit specified in **Condition V.C.2** of this section. Subsequent performance test shall be performed upon request by the Director. [A.A.C. R18-2-312]
- (b) Each performance test for VOC emissions shall be performed using EPA Methods 25A / 25B. [A.A.C. R18-2-312]
- (c) The Permittee shall record and report the results of each performance test for VOC emissions.

### ATTACHMENT "C": EQUIPMENT LIST

The equipment list in Attachment "C" of Significant Revision # 1001720 to Operating Permit # 0363-89 has been updated to include the new equipment.

Equipment Name	NSPS Applicability	Make / Model	Rated Capacity	Serial Number / Equipment ID Number	Date of Manufacture / Construction
Concentrate Feed Hopper	N	TBD / TBD	35,040 tpy	TBD / M-CFH	TBD
Concentrate Belt Feeder	Y	TBD / TBD	35,040 tpy	TBD / M-BFd	TBD
Screw Conveyor 1	N	TBD / TBD	35,040 tpy	TBD / M-SC1	TBD
Steam Deoiler	Y	TBD / TBD	35,040 tpy	TBD / M-SD	TBD
Natural Gas Steam Generator	N	TBD / TBD	4.5 MMBtu/hr	TBD / M-SG	TBD
Natural Gas Deoiler Heater	N	TBD / TBD	6.5 MMBtu/hr	TBD / M-DH	TBD
Venturi Scrubber	N	TBD / TBD	26.28 MMcf/yr	TBD / M-VS	TBD
Packed Scrubber	N	TBD / TBD	26.28 MMcf/yr	TBD / M-PS	TBD
Flare	N	TBD / TBD	0.255 MMBtu/hr	TBD / M-F	TBD
Settling Tank	N	TBD / TBD	240 Gallons/hr	TBD / M-ST	TBD
CCD Thickeners (2)	N	TBD / TBD	26,280 tpy	TBD / M-CCD 1 & 2	TBD
Belt Filter	Y	TBD / TBD	26,280 tpy	TBD / M-BFIt	TBD
Filter 2	N	TBD / TBD	26,280 tpy	TBD / M-PF	TBD
MoO <sub>3</sub> Hopper	N	TBD / TBD	26,280 tpy	TBD / M-MoH	TBD
Screw Conveyor 2	N	TBD / TBD	26,280 tpy	TBD / M-SC2	TBD
MoO <sub>3</sub> Storage Bin	Y	TBD / TBD	75 ft <sup>3</sup>	TBD / M-SB	TBD
Mixer Extraction Settlers (2)	N	TBD / TBD	131.4 MMGal/yr	TBD / M-MXS1&2	TBD
Mixer Washer Settler	N	TBD / TBD	131.4 MMGal/yr	TBD / M-MWS	TBD
Mixer Stripper Settler	N	TBD / TBD	131.4 MMGal/yr	TBD / M-MSS	TBD